

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION**

3D SYSTEMS, INC.

Plaintiff

v.

ENVISIONTEC INC., ENVISIONTEC GMBH,
and SIBCO, INC.,

Defendants

:
:
: Case No. 05-74891
:
: Hon. Avern Cohn
:
: Magistrate Judge
: Hon. R. Steven Whalen
:
: **JURY DEMANDED**
:
:

BODMAN LLP
Susan M. Kornfield (P41071)
Alan N. Harris (P56324)
110 Miller, Suite 300
Ann Arbor, MI 48104
Tel: 734-761-3780
Fax: 734-930-2494
Attorneys for Plaintiff

RADER, FISHMAN & GRAUER, PLLC
R. Terrance Rader (P28747)
39533 Woodward Avenue, Suite 140
Bloomfield Hills, MI 48304
Tel: 248-594-0600
Fax: 248-594-0610
Attorneys for Defendants

LERNER, DAVID, LITTENBERG,
KRUMHOLZ & MENTLIK, LLP
Sidney David (SD 8700)
Stephen B. Goldman (SG 4018)
Samantha M. Kameros (SK 8223)
600 South Avenue West
Westfield, NJ 07090-1497
Tel: 908-654-5000
Fax: 908-654-7866
Attorneys for Plaintiff

CLAIM CONSTRUCTION CHARTS OF 3D SYSTEMS, INC.

Pursuant to the Scheduling Order, Plaintiff 3D Systems, Inc. hereby submits its claim construction for the terms of those preliminary claims currently identified by 3D Systems which may require construction by the Court.

U.S. Patent No. 5,902,537	Claim Construction
81. An apparatus for forming at least a portion of a three-dimensional object on a substantially cross-sectional basis from a material capable of physical transformation upon exposure to synergistic stimulation , comprising:	synergistic stimulation : a stimulus which is capable of causing the transformation of a material such as electro-magnetic radiation, e.g., infrared radiation, visible radiation (visible light), ultraviolet radiation and laser radiation, electron beams and reactive chemicals.
means for supplying data descriptive of the object;	Construed pursuant to Section 112, Paragraph 6. <u>Function</u> : supplying data descriptive of the object. <u>Structure</u> : CAD data file.
a container for containing a volume of material having a working surface ;	working surface : the surface of the building material.
an applicator for forming layers of material over at least portions of previously formed object cross-sections, the applicator having a bottom opening located in proximity to the working surface;	
a vacuum pump coupled to the applicator for drawing up material from the working surface through the bottom opening and into the applicator;	
means for sweeping the applicator across at least a portion of at least some of the previously formed object	Construed pursuant to Section 112, Paragraph 6.

cross-sections;	and	<u>Function:</u> sweeping the applicator across at least a portion of at least some of the previously formed object cross-sections. <u>Structure:</u> drive system such as a threaded drive shaft and motor.
a source of synergistic stimulation for exposing the layers according to the descriptive data to form the at least portion of the object from a plurality of object cross-sections.		
82. A method for forming at least a portion of a three-dimensional object on a substantially cross-sectional basis from a material capable of physical transformation upon exposure to synergistic stimulation , comprising		synergistic stimulation: See claim 81.
supplying data descriptive of the object;		
containing a volume of material having a working surface ;		working surface: See claim 81.
locating an applicator having a bottom opening in proximity to the working surface;		
forming a meniscus of material between the applicator and working surface;		meniscus: building material which bridges a gap between the working surface and the bottom of the applicator.
using a vacuum pump to draw up material from the working surface into the applicator through the bottom opening thereby at least partially filling the applicator;		
forming a layer over at least a portion of a previously formed object cross-section including dispensing material from the applicator by sweeping the applicator across at least a portion of the previously formed object cross-section;		
exposing selected portions of the layer to synergistic stimulation according to the descriptive data to form an object cross-section adhered to the previously		

formed object cross-section; and	
repeating said forming and exposing to form subsequent layers and cross-sections to form the at least portion of the object.	
U.S. Patent No. 5,651,934	Claim Construction
1. A method for stereolithographically forming a portion of a three-dimensional object wherein a subsequent layer of the three-dimensional object is formed over a previously formed layer of the object, comprising the steps:	stereolithographically: building a three dimensional object by successively curing a plurality of layers of a curable medium.
a) holding a volume of a building material having a working surface wherein the building material is capable of selective physical transformation upon exposure to prescribed synergistic stimulation ;	working surface: the surface of the building material. synergistic stimulation: a stimulus which is capable of causing the transformation of a material such as electro-magnetic radiation, e.g., ultraviolet radiation, visible radiation (visible light) and invisible radiation, and electron beams.
b) forming a uniform coating of desired layer thickness over the previously formed layer, including sweeping a smoothing element at least once over the previously formed layer, said smoothing element having a plurality of substantially separate members on a lower surface thereof for contacting the building material; and	
c) applying a prescribed pattern of synergistic stimulation to the building material at the working surface to transform at least a portion of the building material to form the subsequent layer.	
10. A method for stereolithographically forming at least a portion of a three-dimensional object comprising a next layer of the three-dimensional object situated over a previously formed layer, said next layer having a desired layer thickness and said previously formed layer having an upper	stereolithographically: See claim 1.

surface, comprising the steps:	
a) holding a volume of a building material;	
b) applying a coating of building material, said coating including excess material over at least a portion of the upper surface of the previously formed layer of the object;	
c) displacing the previously formed layer relative to a desired working surface so that the upper surface of the previously formed layer is positioned to a first level which is less than said layer thickness below said working surface;	working surface: See claim 1.
d) displacing material of said coating of building material to provide a smooth coating of building material of the desired thickness over the previously formed layer, while the upper surface of the previously formed layer is positioned at said first level;	
e) relatively positioning the upper surface of the previously formed layer to be substantially one layer thickness below the desired working surface; and	
f) applying a prescribed pattern of synergistic stimulation to the building material at the desired working surface in order to transform at least a portion of the building material, whereby the next layer is formed over the previously formed layer.	synergistic stimulation: See claim 1.
U.S. Patent No. 6,048,487	Claim Construction
1. A method for stereolithographically forming at least a portion of a three-dimensional object wherein a subsequent layer of the three-	stereolithographically: building a three dimensional object by successively curing a plurality of layers of a curable medium.

dimensional object, having a layer thickness, is formed over a previously formed layer of the object, comprising:	
a) holding a volume of a building material capable of selective transformation upon exposure to prescribed stimulation ;	stimulation : a stimulus which is capable of causing the transformation of a material such as electro-magnetic radiation, e.g., ultraviolet radiation, include visible radiation (visible light) and invisible radiation, and electron beams.
b) forming a coating of desired thickness over the previously formed layer including sweeping a recoating device over the previously formed layer with a value of a gap between a lower surface of the recoating device and a desired working surface of the building material which is different than zero;	working surface : the surface of the building material.
c) applying a pattern of prescribed stimulation to the building material to form the subsequent layer.	
2. The method of claim 1 wherein the gap between the lower surface of the recoating device and the desired working surface of the building material is greater than zero.	
3. The method of claim 1 wherein the gap between the lower surface of the recoating device and the desired working surface of the building material is less than zero.	.
15. A method for stereolithographically forming at least a portion of a three-dimensional object wherein a subsequent layer of the three-dimensional object, having a layer thickness, is formed over a previously formed layer of the object, comprising:	stereolithographically : See claim 1.
a) holding a volume of a building material capable of selective transformation upon exposure to prescribed stimulation ;	stimulation : See claim 1.

b) forming a coating of desired thickness over the previously formed layer including sweeping a recoating device over the previously formed layer with a value of a clearance between a lower surface of the recoating device and an upper surface of the previously formed layer which is different than the layer thickness;	
c) applying a pattern of prescribed stimulation to the building material to form the subsequent layer.	
33. A method for stereolithographically forming at least a portion of a three-dimensional object wherein a subsequent layer of the three-dimensional object is formed over a previously formed layer of the object, comprising:	stereolithographically: See claim 1.
a) holding a volume of a building material capable of selective transformation upon exposure to prescribed stimulation ;	stimulation: See claim 1.
b) forming a coating over the previously formed layer including sweeping a recoating device in a direction different from a direction of sweeping during a previous sweep of the recoating device; and	
c) applying a pattern of prescribed stimulation to the building material in order to transform at least a portion of the building material, whereby the subsequent layer is formed over the previously formed layer.	

U.S. Patent No. 5,630,981	Claim Construction
10. A method of producing a three-dimensional object from a medium capable of	radiation: energy such as ultraviolet radiation, visible radiation (visible light), invisible radiation and electron

selective physical transformation when subjected to prescribed radiation , said method comprising the steps of:	beams.
providing said medium;	
providing said prescribed radiation;	
providing data representing the three-dimensional object to be formed which was generated on CAD system;	CAD : computer aided design.
forming a first cross-sectional layer of structure by exposing said medium to said prescribed radiation;	
forming successive layers of medium adjacent to any previously formed cross-sectional layers of structure;	
forming and adhering successive cross-sectional layers of structure to any previously formed cross-sectional layers of structure by exposing said medium to said prescribed radiation in response to said data, whereby a plurality of adhered cross-sectional layers of structure form the three-dimensional object.	
11. The method of claim 10 wherein the medium is a photopolymer and said prescribed radiation is light.	

U.S. Patent No. 4,929,402	Claim Construction
16. A method for providing a three-dimensional object from a medium capable of altering its physical state when subjected to prescribed radiation , said method comprising:	radiation: energy such as ultraviolet radiation, visible radiation (visible light), invisible radiation and electron beams.
containing a body of medium capable of altering its physical state in response to prescribed radiation, said medium being sufficiently absorptive of said radiation to enable formation of an adequately cohesive lamina thinner than one millimeter and capable of being partially unsupported by any other lamina during formation;	
irradiating a designated surface of said medium with a prescribed pattern to provide a thin, cross-sectional lamina of less than one millimeter in thickness at said designated surface;	
moving the lamina formed away from said designated surface; and	
repeating said exposing and moving steps and thereby repeatedly forming a plurality of such laminae in succession at said designated surface such that each successive lamina is formed integrally with the immediately	

preceding lamina to build the three-dimensional object.	
U.S. Patent No. 5,345,391	Claim Construction
16. A method for forming a three-dimensional object from a material capable of selective physical transformation upon exposure to synergistic stimulation , comprising:	synergistic stimulation: a stimulus which is capable of causing transformation of a material such as electromagnetic radiation, e.g., infrared radiation, visible radiation (visible light), ultraviolet radiation and laser radiation, and electron beams.
orienting a slicing axis to improve object building capability;	slicing axis: an axis which is normal to the slice planes.
spacing a plurality of slicing planes along the slicing axis;	Slicing planes: planes representing cross-sections of the object to be built.
forming a plurality of cross-sectional representations, at least in part, from said [sic] object representation at at least one of said planes; and	
forming said object on a cross-section by cross-section basis in accordance with said cross-sectional representations.	
U.S. Patent No. 5,137,662	Claim Construction
57. A process for producing a high resolution reproduction of an object cross-section by cross-section out of a material capable of selective physical transformation upon exposure to synergistic stimulation , comprising:	synergistic stimulation: a stimulus which is capable of causing transformation of a material such as electromagnetic radiation, e.g., infrared radiation, visible radiation (visible light), ultraviolet radiation and laser radiation, and electron beams.
providing an object descriptive representation ;	object descriptive representation: data descriptive of the object.

forming cross-sectional representations from said object descriptive representation, wherein at least some of the cross-sectional representation are formed from said object descriptive representation at planes corresponding to slicing planes ; and	Slicing planes: planes representing cross-sections of the object to be built.
selectively exposing layers of the material in accordance with said cross-sectional representations to form said object cross-section by cross-section.	
U.S. Patent No. 5,571,471	Claim Construction
1. A method of producing a three-dimensional object from a liquid medium by forming first and second cross-sectional layers of structure of said object at a surface of said liquid medium, said method comprising the steps of:	
providing a body of said liquid medium;	
forming said first cross-sectional layer of structure of said object at said surface of said liquid medium;	
coating said first cross-sectional layer of structure of said object with a layer said liquid medium having a desired thickness, said coating step including the steps of:	

firstly, positioning said first cross-sectional layer of structure into said liquid medium at a depth greater than said desired thickness; and	
secondly, positioning said first cross-sectional layer of structure at a depth equal to said desired thickness;	
forming said second cross-sectional layer of structure of said object at said surface of said liquid medium to build up said three-dimensional object.	
U.S. Patent No. 4,999,143	Claim Construction
2. A method for producing a three-dimensional object from a medium capable of selective physical transformation upon exposure to synergistic stimulation , comprising the following steps:	synergistic stimulation: a stimulus which is capable of causing transformation of a material such as electromagnetic radiation, e.g., infrared radiation, visible radiation (visible light), ultraviolet radiation and laser radiation, and electron beams.
forming a three-dimensional object, having an object surface spaced from a surface of a platform by a spacing, upon exposure to said synergistic stimulation, the platform surface being perforated with at least one hole having a diameter; and	
forming a removable support in said spacing from a material, said support in cross-sectional	thin: having a thickness which facilitates removal of the support from the object.

width being thin , and extending in height at least between said object and platform surfaces, and also extending by a distance approximately greater than said diameter along said platform surface.	
3. A method for producing a three-dimensional object from a medium capable of selective physical transformation upon exposure to synergistic stimulation , comprising the steps of:	synergistic stimulation : See claim 2.
forming a three-dimensional object, having a first object surface spaced from a second surface by a spacing, said first object surface covering spaced, internal object members, said members being spaced by an approximately constant distance, upon exposure of said medium to said synergistic stimulation; and	
forming a removable support in said spacing from a material, said support in cross-sectional width being thin , and extending in height at least between said first and second surfaces, and also extending by a distance greater than said approximately constant distance along said first object surface.	thin : See claim 2.
6. A method for producing a three-dimensional object	synergistic stimulation : See claim 2.

from a medium capable of selective physical transformation upon exposure to synergistic stimulation , comprising the following steps:	
forming a three-dimensional object having a first object surface spaced from a second surface by a spacing, and at least partially opposing said second surface; and	
forming a removable support in said spacing substantially layer by layer from a material, said support in cross-sectional width being thin , and comprising a solid extending in height by at least two layers at least between said first and second surfaces, and also extending substantially more than said width along at least one of said first and second surfaces	thin: See claim 2.

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Respectfully submitted,

s/Susan M. Kornfield
Susan M. Kornfield (P41071)
Alan N. Harris (P56324)
BODMAN LLP
110 Miller, Suite 300
Ann Arbor, MI 48104
Telephone: (734) 761-3780
Facsimile: (734) 930-2494

Sidney David (SD 8700)
Stephen B. Goldman (SG 4018)
Samantha M. Kameros (SK 8223)

LERNER, DAVID, LITTENBERG,
KRUMHOLZ & MENTLIK, LLP
600 South Avenue West
Westfield, New Jersey 07090-1497
Telephone: (908) 654-5000
Facsimile: (908) 654-7866

Jerome W. Hoffman
Florida Bar No. 0258830
David C. Borucke
Florida Bar No. 039195
HOLLAND & KNIGHT LLP
Tallahassee, FL 32302
Telephone: (850) 224-7000
Facsimile: (850) 224-8832

Attorneys for Plaintiff

CERTIFICATE OF SERVICE

I hereby certify that on November 16, 2006, I electronically filed the foregoing Claim Construction Charts of 3D Systems, Inc. with the Clerk of the Court using the ECF system which will send notification of such filing to the following:

R. Terrance Rader rtr@raderfishman.com.
Steven Hansen @ srh@raderfishman.com

I declare under penalty of perjury that the foregoing statements are true and correct.

s/Susan M. Kornfield
Susan M. Kornfield
Alan N. Harris (P56324)
BODMAN LLP
110 Miller Avenue, Suite 300
Ann Arbor, Michigan 48104-1339
Telephone: 734-761-3780
Primary Email:
skornfield@bodmanllp.com
P41071